

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

KNORZER et al.

Art Unit: Unknown

Application No. Unknown

Examiner: Unknown

Filed: December 14, 2001

For: ELECTRIC AXIAL FLOW
MACHINE

PENDING CLAIMS AFTER ENTRY OF PRELIMINARY AMENDMENT

1. An electric axial flow machine including an ironless disk-shaped rotor arranged on a machine shaft and having permanent magnets embedded in a fiber- or fabric-reinforced plastic, and, on both sides, next to the rotor, a stator, wherein the permanent magnets are each joined to the surrounding fiber- or fabric-reinforced plastic so that the permanent magnets and the machine shaft , form a dimensionally stable unit.

2. The electric axial flow machine as claimed in claim 1, wherein the permanent magnets are arranged in a circle around the machine shaft and the fiber- or fabric-reinforced plastic extends between the permanent magnets over at least 10%, of the circle.

3. The electric axial flow machine as claimed in claim 1, wherein the rotor has on an outer circumference or proximate the outer circumference a stiffening band comprising preimpregnated fibrous material, the rotor becoming thicker with increasing distance from the machine shaft.

4. The electric axial flow machine as claimed in claim 1, comprising means for determining magnetic pole position of the rotor including a magnetic strip arranged on an outer circumference of the rotor and having a radially magnetized series of magnetic poles arranged in correspondence to the permanent magnets embedded in the fiber- or fabric-reinforced plastic, and fixed-in-place Hall probes interacting with the magnetic poles.

5. The electric axial flow machine as claimed in claim 1, wherein the fiber- or fabric-reinforced plastic comprises an epoxy resin or an imide resin with glass fiber reinforcement.

6. The electric axial flow machine as claimed in claim 1, wherein the permanent magnets respectively comprise at least two separate magnet segments next to one another, in a circumferential direction, joined by a metal adhesive.

7. The electric axial flow machine as claimed in claim 1, wherein the stator comprises an annular yoke including slots extending approximately radially and through which multi-phase windings pass.

8. The electric axial flow machine as claimed in claim 7, wherein one of the permanent magnets and the slots are transposed in a circumferential direction.

9. The electric axial flow machine as claimed in claim 1, including two stators electrically offset in relation to one another in a circumferential direction by 180° so that magnetic fluxes in the circumferential direction in the rotor are oppositely oriented and essentially cancel one another.

10. A method for producing a rotor for an electric axial flow machine as claimed in claim 1, wherein the machine shaft and the permanent magnets are arranged in a mold and a pre-heated fiber- or fabric-reinforced plastic is subsequently poured under pressure into the mold, which is heated.

11. The method as claimed in claim 10, including pouring the fiber- or fabric-reinforced plastic at a temperature of at least 200°C and under a pressure of 500 - 1500 bar.